18 ~~20~~. (New) A shielding device in accordance with claim ~~19~~ 13, wherein:

one end of each of said webs is connected to said base rail and is substantially parallel with said base rail plane;

another end of each of said webs is connected to said shielding plate and is substantially parallel with said plane of said shielding plate.

16 ~~21~~. (New) A shielding device in accordance with claim ~~20~~ 15, wherein:

said another end of said webs is narrower in width than a width of a respective said shielding plate adjoining said another end of said web.

14 ~~22~~. (New) A shielding device in accordance with claim ~~18~~ 12, wherein:

said base rail, said webs and said shielding plates are formed from a single homogeneous sheet of metal.

REMARKS

The title and claims have been amended to improve the style of this application. It is Applicant's position that the title is clearly indicative of the invention to which the claims are directed. If the Examiner has any suggestions for alternate wording of the title, the Examiner is invited to contact Applicant's representative by telephone to discuss possible changes.

The Office Action also provides suggestions with regard to specification arrangement. Applicant notes that with the Preliminary Amendment, filed simultaneously with this

application, a substitute specification was enclosed. This substitute specification follows many of the suggested specification arrangements described in the Office Action. Applicant is enclosing another copy of the substitute specification and the marked-up specification for the Examiner's review.

Applicant acknowledges and thanks the Examiner for indicating that claims 8 and 10 would be allowable if amended to overcome the rejections with regard to form, and written in independent form.

Claim 7, 9 and 11 have been rejected as being anticipated by Broeksteeg.

New claims 16 and 18 have been added, and claims 7 and 9 have been amended, to set forth that the shielding plates have a width which is wider than a width of the webs. This feature is clearly shown in the embodiment of Figure 4 of the present application. As one can see, the distance from right-to-left of element 6 is larger than the distance from right-to-left of element 4. The rejection equates elements 168, 170, 172, 174 and 182 with the shielding plates of the present invention. The rejection further equates the web of the present invention with an unnumbered, ajunction portion between member 168 and member 162 of Broeksteeg. Applicant has reviewed these elements of Broeksteeg, and finds no teaching nor suggestion of a web which is narrower in width than any structure equated with a shielding plate of the present invention. It appears that elements 168, 170, 172, 174 and 182 are all the same width, especially where they connect to element 162. Applicant finds no incentive in Broeksteeg which would lead a person of ordinary skill in the art to have a web connecting a shield plate to a base rail, where the web is narrower than the shielding plate. Therefore since this feature

of the web is not taught nor suggested in Broeksteeg, Broeksteeg cannot anticipate all of the features of claims 7, 9, 16 and 18. Claims 7, 9, 16 and 18 therefore cannot be anticipated by Broeksteeg, and are allowable over Broeksteeg.

Claim 12 has been rejected as being anticipated by Jochen.

The rejection equates the shielding plates of claim 12 with element 186 of Jochen, and the base rail of claim 12 with a mid portion of member 132 adjacent to member 186. Applicant notes that claim 12 sets forth that the shielding plates are connected to a base rail via a web. The rejection does not indicate what portion of Jochen is equated with the web of claim 12. Applicant has reviewed Jochen, and finds no teaching nor suggestion of a web connecting a shielding plate to a base rail.

Applicant further finds it difficult to understand which structure in Jochen the rejection is equating with the base rail of claim 12. The rejection indicates that it is the mid portion of member 132. However, the rejection does not indicate that if it is the mid portion between the top and bottom of element 132 or the right and left of element 132. Furthermore, Applicant only finds Figure 5a in Jochen to both show reference numeral 132 and 186. Applicant notes that Figures 8b and 9 also show reference numeral 132, however, they do not show reference numeral 186. Applicant therefore assumes that the rejection therefore is referring to structure in Figure 5a.

Applicant also notes that element 144 of Jochen which has been compared to the connection strip of the present invention, is described in Jochen as a plurality of openings, column 6 line 42. Furthermore, elements 186 of Jochen are not described as being shielding

plates, but instead are described as a ground contact tab, column 8 line 59. Applicant finds no teaching nor suggestion of a shielding plate in Jochen. Since Jochen does not teach nor suggest all of the features of claim 12, Jochen therefore cannot anticipate claim 12.

Claim 13 sets forth that the shielding plates are spaced from the insulation piercing terminal contact elements. Applicant has reviewed Jochen, and finds elements 186 to be connected to elements 130. Therefore Jochen does not describe shielding plates which are spaced from insulation piercing terminal contact elements.

Claim 14 sets forth that the shielding plates are electrically insulated from the insulation piercing terminal contact elements. Applicant notes that Jochen specifically indicates that elements 186 and 130 are electrically connected, and therefore claim 14 further defines over Jochen.

Claim 15 sets forth that the web includes a substantially 90° twist. Applicant finds no teaching nor suggestion of any structure in the area indicated by the rejection as having a substantially 90° twist.

The remaining dependent claims also further emphasize these features or other features which are not found in the prior art.

If the Examiner has any questions, comments or suggestions which would further favorable prosecution of this application, the Examiner is invited to contact Applicant's representative by telephone to discuss possible changes.

At this time Applicant respectfully requests reconsideration, and based on the above amendments and remarks, respectfully solicits allowance of this application.

Respectfully submitted
for Applicant,

By: _____

Theobald Dengler
Registration No. 34,575
McGLEW AND TUTTLE, P.C.

TD:tf/da
70140.9
Enclosed: Marked-Up Version of the Title
Marked-Up Version of the Claims
copy of the Substitute Specification from Preliminary Amendment
copy of the Marked-Up Specification from Preliminary Amendment
check in the amount of $84.00 (one extra independent claim)

DATED: February 25, 2002
SCARBOROUGH STATION
SCARBOROUGH, NEW YORK 10510-0827
(914) 941-5600

SHOULD ANY OTHER FEE BE REQUIRED, THE PATENT AND TRADEMARK OFFICE IS HEREBY REQUESTED TO CHARGE SUCH FEE TO OUR DEPOSIT ACCOUNT 13-0410.

I HEREBY CERTIFY THAT THIS CORRESPONDENCE IS BEING DEPOSITED WITH THE UNITED STATES POSTAL SERVICE AS EXPRESS MAIL IN AN ENVELOPE ADDRESSED TO: COMMISSIONER OF PATENTS AND TRADEMARKS, WASHINGTON, D.C. 20231, NO.: EV071195781US

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BY: _____ DATE: February 25, 2002

MARKED-UP VERSION OF THE TITLE

CROSSTALK SHIELDING DEVICE FOR CONNECTION STRIPS IN TELECOMMUNICATIONS AND DATA ~~ENGINEERING~~COMMUNICATION

MARKED-UP VERSION OF THE CLAIMS

7. (~~New~~Amended) A shielding device for connection strips for telecommunications and data engineering applications, the shielding device comprising:

a plurality of shielding plates;

at least one base rail, said shielding plates and said base rail being integrally formed from a metal sheet with each shielding plate connected to the base rail via a web narrow ~~web~~er than said shielding plates, each of said said shielding plates being arranged rotated through approximately 90° with respect to the base rail.

9. (~~New~~Amended) A process of producing a shielding device for connection strips in telecommunications and data engineering applications, the process comprising the steps of:

providing a metal sheet;

forming a number of shielding plates, a base rail supporting the shielding plates, and webs connecting the respective shielding plates to the base rail integrally from the metal sheet, said webs being formed narrower than said shielding plates;

subsequently rotating the shielding plates in the region of the webs through approximately 90° with respect to the base rail.

12. (~~New~~Amended) A connection strip, comprising:

a plastic housing;

insulation-piercing terminal contact elements arranged in said plastic housing;

shielding plates arranged between said insulation-piercing terminal contact elements; and

at least one ~~ground~~base rail connected to said shielding plates, said shielding plates and said base rail being integrally formed from a metal sheet with each shielding plate being connected to said base rail via a web and being arranged rotated approximately 90° with respect to said base rail.

MARKED UP SPECIFICATION

Docket # 70140

SHIELDING DEVICE FOR CONNECTION STRIPS IN TELECOMMUNICATIONS AND DATA ENGINEERING

FIELD OF THE INVENTION

The invention relates to a shielding device for connection strips in telecommunications and data engineering, comprising a number of shielding plates and at least one base rail allocated to the latter.

BACKGROUND OF THE INVENTION

A shielding device of the generic type is already known from the connection strip

disclosed in US 5,160,273. Here, the problem of crosstalk between ⊢⊣adjacent insulation-piercing terminal contact elements⊢⊣ of the connection strip is solved by the insertion of a multiplicity of electrically conductive shielding plates between the individual pairs of insulation-piercing terminal contact elements. The problem of crosstalk occurs when transmitting large volumes of information via electrical lines, the information being transmitted at high frequencies. Transmitting at high ⊢⊣frequencies produces radiation and interference between adjacent lines, particularly when these lines are arranged close beside one another in the connection strip. Electrically conductive shielding plates are inserted between a pair of insulation-piercing terminal⊢⊣ contact elements, the spacing between two adjacent pairs of insulation-piercing terminal contact elements being larger than the spacing between adjacent insulation-piercing terminal contact elements in a pair. The shielding plates are in this case inserted between pairs of insulation-piercing terminal contact elements in slots which extend transversely to the longitudinal direction of the plastic body of the connection strip, and contact the base rail situated in the longitudinal direction inside the plastic body. A disadvantage of this is that, when fitting the component into the plastic body, it is first necessary to fit the base rail, which has contact tongues for contacting the individual shielding plates, and that it⊢⊣ is subsequently necessary to push the individual shielding plates into the connection strip. Consequently, the complexity of assembly is relatively high in order to provide the connection strip with the shielding device for high transmission rates in telecommunications and data engineering.

SUMMARY AND OBJECTS OF THE INVENTION

The invention is therefore based on the object of improving the shielding device of the generic type in order to simplify assembly.

[

] To achieve this object, the invention provides[,] for the shielding plates and the base rail to be integrally formed from a metal plate, and for each shielding plate to be connected to the base rail via a narrow web and arranged rotated through approximately 90° with respect to the base rail. The shielding device [,]according to the invention thus forms an integral component which is made of metallic material and which, during assembly of a connection strip for telecommunications and data engineering, is inserted into the plastic housing of the connection strip with[,] its base rail, and its shielding plates, which are integrally connected to the base rail, are guided into all the preformed slots inside the connection strip at the same time. This simplifies assembly considerably.

[

] In a further embodiment of the invention, the spacings between the shielding plates on a base rail may be designed to be different from one another. This enables a shielding plate to be matched to different applications.

[

] The invention also relates to a method of producing the shielding device ~~[in accordance with patent claim 3, to a connection strip for the shielding device in accordance with patent~~

~~claim 5, and finally 5 to the use of the shielding device inside~~]wherein a number of shielding plates and a base rail supporting the latter, as well as webs connecting the shielding plates to the base rail, are integrally formed from a metal sheet. The shielding plates are subsequently rotated in the region of the webs through approximately 90° with respect to the base rail.

According to a further aspect of the invention, a connection strip ~~[in accordance with claim 6.~~

~~The invention is explained in more detail below with the aid of an exemplary embodiment of a shielding device which can be fitted, or is fitted, into a connection strip~~]is provided for telecommunications and data engineering. ~~[This exemplary embodiment is illustrated in more detail in the drawings, in which: Figure 1 shows~~]The connection strip has insulation-piercing terminal contact elements arranged in a plastic housing, and shielding plates arranged between said insulation-piercing terminal contact elements. At least one ground rail is allocated to the shielding plates. The shielding plates and the base rail are integrally formed from a metal sheet. Each shielding plate is connected to the base rail via a narrow web and is arranged rotated through 90° with respect to the base rail.

According to still another aspect of the invention, a process for using a shielding device comprising a base rail and shielding plates is provided wherein the shielding plates are integrally formed on the base rail and are rotated through 90° with respect to the base rail. The device si used as a shielding inside a connection strip for high transmission rates in telecommunications and data engineering applications.

The various features of novelty which characterize the invention are pointed out with

particularity in the claims annexed to and forming a part of this disclosure. For a better understanding of the invention, its operating advantages and specific objects attained by its uses, reference is made to the accompanying drawings and descriptive matter in which a preferred embodiment of the invention is illustrated.

BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings:

Figure 1 is a perspective illustration of the shielding device;

Figure 2 ~~[shows a front view; Figure 3 shows a plan view; Figure 4 shows]~~is a front view of the device of Figure 1;

Figure 3 is a plan view of the device of Figure 1;

Figure 4 is a plan view of a metal sheet having punched-out shielding plates and the base rail;

Figure 5 ~~[shows an]~~is a perspective illustration, corresponding to Figure 4, of a part of the shielding device having a folded base rail;

Figure 6 ~~[shows]~~is a side view of a connection strip;

Figure 7 ~~[shows]~~is a cross ~~[section]~~sectional view along the line A-A in Figure 6;

Figure 8 ~~[shows]~~is a plan view of the connection strip shown in Figure 6; and

Figure 9 ~~[shows]~~is a cross ~~[section]~~sectional view along the line B-B in Figure 8.~~[—In]~~

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to the drawings in particular, in the exemplary embodiment, the shielding device 1 comprises seven flat, essentially U-shaped shielding plates 2, a base rail 3 and seven connection webs 4, which connect the individual shielding plates 2 to the base rail 3. The shielding device 1 is made of conductive metallic material and is integrally formed, in particular punched, with the shielding plates 2, the base rail 3, and the connection webs 4, from a metal sheet 28. The sheet metal 28 is particularly copper, copper alloys, steel or aluminum. The shielding plates 2 and the base rail 3 with the connection webs 4 are initially in the same plane as the metal sheet 28 (as shown in Figure 4). In a work step which follows the cutting-out process, the individual shielding plates 2 are rotated in the region of their 5 connection webs 4 through 90° with respect to the base rail 3. A hole 5 in the base rail 3 is associated with each shielding plate 2 close to the connection web 4, and this hole 5 is used for adjustment during the 4 production process. The metal sheet 28 may also be a metalized plastic strip or the like.

In the view of how the shielding device 1 is processed, shown in Figure 4, the individual shielding plates 2 are of U-shaped design, a roughly rectangular shielding panel 6 adjoining the connection web 4 and being provided with two prong-like shielding forks 7 at the end remote from the connection web 4. These shielding forks 7 are stepped by means of a shoulder 8 which tapers the cross section so that they are matched to the internal cross section of the connection strip 11.

Figure 4 shows the metal sheet 28 with cut-out or punched-out shielding plates 2 of width B with a mean spacing X between one another and with the cut-out or punched-out base rail 3 with the holes 5 which are used for adjustment during production. The length of the metal sheet 28 corresponds to the number of shielding plates 2 of width B plus the cut gaps.

Figure 5 shows the shielding plates 2 which are rotated through 90° with respect to the base rail 3 and are normally at a distance X from one another. To achieve a shorter distance X', a fold 9 is introduced into the base rail 3, as shown in Figure 8.

The shielding device 1 is used for shielding the individual insulation-piercing terminal contact elements 10 inside a connection strip 11 for high transmission rates in telecommunications and data engineering. Such a connection strip 11, having a plurality of insulation-piercing terminal contact elements 10 arranged in pairs, is illustrated and described in more detail in DE 43 25 952 C2 (and in US 5,494,461). US 5,494,461 is hereby incorporated by reference. The connection strip 11 is illustrated in Figures 6 to 9 and is described in more detail below with respect to the shielding device 1 used.

The connection strip 11 comprises a plastic housing 12 made of an upper part 13 and a lower part 14 which are latched to one another by means of latching openings 15 in the upper part 13 and latching lugs 16 in the lower part 14. Terminal slots 17 are formed in the upper

part 13 and have integrally formed terminal lugs 18 and terminal webs 19 which serve to hold the insulation-piercing terminal contact elements 10. The latter are formed from sheet-like flat material and comprise two contact webs 21 enclosing a contact slot 20 between them. A base web 22 is adjoined by contact fingers 23 which merge into spring contacts 24. Two pairs of insulation-piercing terminal contact elements 10 are respectively arranged close beside one another, the spacing D between two adjacent pairs of insulation- piercing terminal contact elements 10 being considerably larger than the spacing d between insulation-piercing terminal contact elements 10 which are close beside one another, as can be seen in Figure 6. The individual shielding plates 2 of the shielding device 1 are inserted into the total of seven wider cross-sectional regions 25 of the connection strip 11, as shown by dashed lines in Figures 6 and 7 and by solid lines in Figures 8 and 9.

To insert the base rail 3 with the individual shielding plates 2 into the housing 12 of the connection strip 11, the upper part 13 in the exemplary embodiment contains seven chambers 26 with respective transverse slots 27 into which the individual shielding plates 2 are pushed. The base rail 3 is situated in a longitudinal slot 21 in the bottom region of the lower part 14, as shown in Figures 7 and 9. The shielding panels 6 and shielding forks 7, which adjoin the latter, of the individual shielding plates 2 essentially take up the whole of the cross section of ~~[- 6 -]~~the interior of the connection strip 11, as shown in Figure 9 in particular, and thus separate the individual pairs of insulation-piercing terminal contact elements 10 in such a manner that greater 5 crosstalk attenuation is achieved for high transmission rates as a

result of the electrically conductive shielding plates 2. The use of the large-area electrically conductive shielding plates 2 in the connection strip 11 does not require the physical volume of the connection strip to be enlarged, nor any greater expense to produce it.

[

] The shielding device 1 does not require any grounding. It is important only that the individual shielding plates 2 are conductively connected to one another. This is achieved by means of the base rail 3, which [,]is common to all the shielding plates 2. The shielding plates 2 influence the electrical field in such a way that the influence charging of an insulation-piercing terminal contact element 10 is []reduced in the adjacent insulation-piercing terminal contact element 10, and the interference voltage is thus small. This produces a relatively high signal-to-noise ratio. The signal-to-noise ratio becomes higher, with the result that higher frequencies can be transmitted without the adjacent lines of the insulation-piercing terminal contact elements 10 having an adverse effect on one another.

[

] The number of shielding plates 2 in a shielding device 1 depends on the number of pairs of ~~[insulation- piercing]~~insulation-piercing terminal contact elements 10. In the exemplary embodiment, an 8-pair module is illustrated, which has seven chambers 26 for a total of seven shielding plates 2. Common pairings are 4/3, 8/7, 10/9, 12/11, 16/15, 20/19, 24/23 and 25/24, where the number of pairs of insulation-piercing terminal contact elements 10 and the number of shielding plates 2 are indicated in each case.

[

} For a ~~[HIGHBAND]~~HIGHBAND® brand 8 connection strip 11, the standard spacing X between the shielding plates 2 is X = 12.6 mm. However, for a ~~[HIGHBAND]~~HIGHBAND® brand 10 connection strip 11, for example, the spacing is X' = 9.6 mm. For this, the folds 9 are introduced into the base rail 3 between each of the individual shielding plates 2. This~~[5]~~ spacing cannot be achieved by directly punching the shielding device 1 out of a metal sheet 28, since the width B of the individual shielding plate 2 needs to be around 12 mm on account of the width of the connection ~~[z]~~strip 11. Hence, for a ~~[HIGHBAND]~~HIGHBAND® brand 8 connection strip 11, 10 the dimensions width B = 12.6 mm and spacing X = 12.6 mm complement one another well. For a narrower spacing X', however, folds 9 are necessary; these may be replaced by any other kind of means for shortening the length of the base rail 3.

{

~~PATENTCLAIMS~~

~~1.~~ While specific embodiments of the invention have been shown and described in detail to illustrate the application of the principles of the invention, it will be understood that the invention may be embodied otherwise without departing from such principles.

ABSTRACT OF THE DISCLOSURE

A shielding device for connection strips in telecommunications and data engineering[, comprising] has a number of shielding plates and at least one base rail [] allocated to the [latter, wherein] shielding plates. To simplify the process of fitting the shielding device inside a connection strip, the shielding plates (2) and the base rail (3) are integrally formed from a metal sheet (28), and[wherein] each shielding plate (2) is connected to the base rail (3) via a narrow web (4) and is arranged rotated through approximately 90° with [] respect to the base rail (3).[

-

2. The shielding device as claimed in claim 1, wherein the spacings (X, X') between the shielding plates (2) can be designed differently, particularly by means of folds (9) in the base rail (3).

3. A method of producing a shielding device for connection strips in telecommunications and data engineering as claimed in claim 1 or 2, wherein a number of shielding plates (2) and a base rail (3) supporting the latter, as well as webs (4) connecting the shielding plates (2) to the base rail (3), are integrally formed from a metal sheet (28), and the shielding plates (2) are subsequently rotated in the region of the webs (4) through approximately 90° with respect to the base rail (3).

4. The method as claimed in claim 3, wherein the spacings (X, X') between the shielding plates (2) can be designed differently, particularly by means of folds (9) in the base rail (3).

~~5. A connection strip for telecommunications and data engineering, having insulation-piercing terminal contact elements arranged in a plastic housing, and shielding plates arranged between said insulation-piercing terminal contact elements, and at least one ground rail allocated to said shielding plates, wherein the shielding plates (2) and the base rail (3) are integrally formed from a metal sheet (28), and wherein each shielding plate (2) is connected to the base rail (3) via a narrow web (4) and is arranged rotated through 90° with respect to the base rail (3).~~

~~6. The use of a shielding device (1), comprising a z base rail (3) and shielding plates (2) which are integrally formed on the latter and are rotated through 90° with respect to the base rail (3), as shielding inside a connection strip (11) for high transmission rates in telecommunications and data engineering.~~

~~ABSTRACT~~

~~The invention relates to a shielding device for connection strips in telecommunications and data engineering, comprising a number of shielding plates and at least one base rail allocated to the latter. To simplify the process of fitting the shielding device inside a connection strip, the shielding plates (2) and the base rail (3) are integrally formed from a metal sheet (28), and each shielding plate (2) is connected to the base rail (3) via a narrow web (4) and is arranged rotated through approximately 90° with respect to the base rail (3). (Fig. 1)~~

~~LIST OF REFERENCE NUMERAL 1 Shielding device 2 Shielding plate 3 Base rail 4 Web 5 Hole 6 Shielding panel 7 Shielding fork 8 Shoulder 9 Fold 10 Insulation-piercing terminal contact elements 11 Connection strip 12 Plastic housing 13 Upper part 14 Lower part 15 Latching opening 16 Latching lug 17 Terminal slot 18 Terminal lug 19 Terminal web 20 Contact leg 21 Longitudinal slot 22 Base web 23 Contact finger 24 Spring contact 25 Cross-sectional region 26 Chamber 27 Transverse slot 28 Metal sheet~~

~~}~~

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